Bibliometric Mapping & Social Network Analysis: A Novel Approach to Determine Reach of Watson’s Caring Theory

<table>
<thead>
<tr>
<th>Teresa J. Sakraida, PhD, RN</th>
<th>Paige Alfonzo, BA, MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assistant Professor</td>
<td>Reference &amp; Instructional Librarian</td>
</tr>
<tr>
<td>College of Nursing</td>
<td>University of Mary Hardin-Baylor</td>
</tr>
<tr>
<td>University of Colorado Denver</td>
<td>Belton, TX   USA</td>
</tr>
<tr>
<td>Aurora, CO     USA</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marie Hastings-Tolsma, PhD, CNM</th>
<th>Lilian Hoffecker, PhD, MLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor,</td>
<td>Research Librarian</td>
</tr>
<tr>
<td>College of Nursing</td>
<td>University of Colorado Denver</td>
</tr>
<tr>
<td>University of Colorado Denver</td>
<td>Aurora, CO     USA</td>
</tr>
<tr>
<td>Aurora, CO     USA</td>
<td></td>
</tr>
</tbody>
</table>
Background

• Widespread agreement that theory use is crucial for the discipline’s growth.

• High-tech and often impersonal healthcare creates interest in how Caring Science improves practice.

• Watson’s Caring Science (2006) as a theory expanding global interest over past decades.

  – Little study of how it is used, temporal changes in use, and the impact on nursing.
Watson’s Caring Theory

- Work considered a philosophy, grand theory, and with mid-range theory: Transpersonal Caring
- Caring based on a relational ontology.
- Believes it is the essence of nursing.
- 5 core principles, 10 caritas processes.

http://watsoncaringscience.org

Impact of Watson’s Work

- Interest in exploring the diverse impact of all Watson research products
  - Traditional journal articles, books
  - Emerging products: blog posts, datasets, software.
- This research sought to tell a data-driven story
- What has been the impact of Watson’s Caring Science?
Impact Characterized

- Change in behavior
- Can indicate acceptance by scientific community
- Dispersion of the publications
- Not to be confused with quality of scholarship
  - Papers/publications negatively reviewed can have great dispersion
  - The more narrow the area of interest the more focused in distribution
- Influenced by your peer scholars and through social networking, so by the public who are the consumers of health care
Aims

This methodological study examined Watson’s caring science for:

• utility of bibliometric mapping and social networking analysis techniques to document global use
• determine the impact of use within the discipline
• describe global temporal trends in reach of the theory
Methodology: Two-Fold Process

**BIBLIOMETRICS**
- Mapping of more traditional citations
- Citations in Web of Science
- Key Words: Watson Caring Theory, Caring Theory, Caring Science
- 1980-2014
- N = 136

**SOCIAL NETWORK ANALYSIS**
- Analysis of Social Media to determine theory use
- 2010-2014
- Software limitation (new)
Powerful Infographic Techniques

- Almost no attention in nursing to methods that could be used to evaluate use and impact of nursing theory (or other scholarship).
- New tools are available and should be used
- Among them, 2 used in this research -
  - Bibliometrics
  - Social Media

Sources:
http://adenu.ia.uned.es/workshops/recsystel2010/bibliometrics.htm
http://blogs.library.ucla.edu/sel/2012/05/07/biomed-library-bibliometrics-workshop-61/
Bibliometrics

- Method which allows analysis of
  - Who cited who
  - Patterns in scholarly works
  - Analysis of scholarly impact, productivity
  - Determination of prestige of work
- Range of statistical analyses related to publications and the authors.
- Measures IMPACT not quality.
Source Type

- Range of bibliometric indicators (e.g., h-index, JIF)
  - This work used citation analysis
    • How many times Watson pubs were cited on journal and citation indexes
- Web of Science (WoS)
  - No one citation database preferable for everything
    • WoS used here because of availability (vs Scopus)
- Some citations are more important than others – so source type will vary.
- Key Question: What is the influence of the article?
Social Network Analysis

- Non-scholarly discussion/remarks in social networks do demonstrate impact (e.g. Twitter, Facebook, LinkedIn)

- Newer online reference managers can be used to assess impact with broader metrics.
Altmetrics

- Method providing a composite trace of impact far richer than historic methods (e.g., JIF, h-index)
- Tracks the thousands of scholarly papers discovered, discussed, and shared each day (free)
- Collects mentions of scholarly articles from all across the Web (gathered from newspapers, blogs, social media).
- Answers the question: What are people saying about Watson’s works online?
### Altmetrics Categories of Impact: Watson’s Caring Science (2010-14)

<table>
<thead>
<tr>
<th>AREAS COVERED</th>
<th>N=25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viewed</td>
<td>Html views &amp; pdf downloads</td>
</tr>
<tr>
<td>Discussed</td>
<td>Journal comments, science blogs, Twitter, Facebook, Wikipedia, other social media</td>
</tr>
<tr>
<td>Saved</td>
<td>Social Bookmarks→Mendeley, CiteULike, Connotea</td>
</tr>
<tr>
<td>Cited</td>
<td>Citations in the scholarly literature not tracked well in Altmetrics. (Better to use WoS, Scopus, CrossRef, etc.)</td>
</tr>
<tr>
<td>Recommended</td>
<td>e.g., F1000 Prime</td>
</tr>
</tbody>
</table>
Altmetrics data for “caring science” using Altmetric Explorer

Twitter Feed →
Altmetrics data for “caring science” using Altmetric Explorer - Tweets
Non-US Libraries with
Nursing: The Philosophy and Science of Caring

Map generated with Tableau Public 8.1

Tableau maps: www.tableau.com/mapsdata
Bibliometrics
Results

- Bibliometric Co-citation:
  - Shows the similarity (and potentially the impact) of Watson’s works on other authors

- Social Network Analysis:
  - Wide geographic distribution of first book
  - Actual usage of theory remains unknown
Limitations

- The use of abstracts included problem of non-inclusion of theory or author, so findings limited by those works clearly specifying Watson’s Theory
- Altmetrics are prone to self-citation, gaming and other mechanisms to boost a citations apparent use.
- Citation analysis limited by journals in database.
- Citation entry errors result in skewed data, e.g. Watson, J & Watson, Jean
Not everything that counts can be counted, and not everything that is counted counts.

Albert Einstein
Recommendations

• Nurse Scientists/Scholars in preparation of abstracts should include theory title, year, and specify key words in scholarly publications.
  – Q: Will others find my work?

• Be selective of journals for publication work, Consider the journals database source.
Implications

- Infographics offers a powerful method for documenting use & impact
- Uses can visually demonstrate the power of nursing scholarship both for the individual and the larger discipline
- Uses can identify gaps in nursing scholarship
Implications

Theoretical

- Goal of approach:
  - Increase visibility of works
  - Improve ‘care’ of patients
- Rethink use of caring theory in education, research

Methodological

- Nurses must use social media to get works noted
  - Empower patients
- Collaborative publishing → attracts more citations
- Institutions need a marketing department to assist with social media, as well as traditional publishing routes
  - Need presence on social media
Uses of Bibliometric & Social Network Analyses

- Assess own research performance
- Evaluate/track impact of published works
- Identify journals with greatest impact in my area of scholarship
- Showcase the extent of your own works:
  - Support applications for promotion, tenure & grants*
- Showcase University, department, discipline
Caring is the essence of nursing.

Jean Watson

Source: http://www.britevents.com/features/famous-british-graves/
Infosthetics – the beauty of data visualization where form follows the data.

Vande Moere, 2007
References


References


Co-citation Image Credit:

Comments and Questions

Source:
https://www.dur.ac.uk/library/research/bibliometrics/